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HOP SCIENCE

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Searching the world of hops and brewing to bring you the latest news and research ... so you don't have to!

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HOPS AND YEAST – THE MAGIC TEAM

When it comes to flavour impact, hops and yeast are the magicians in beer. However, their interaction, especially in beers dry hopped during fermentation, is only poorly understood. Also, the yeast flavour profiles of brewing yeasts without hops are hard to find and often not yet described. This Belgian research team has tested a couple of yeast strains and found examples for both synergistic effects in producing fruity esters or other volatiles but also yeast strains that suppressed hop-derived fruitiness. Yeasts are a very effective raw material for further beer flavour diversification. By carefully choosing yeast strains, brewers can accentuate the fruity flavour profile of heavily hopped beers with tropical and citrus aromas. This positive interaction also holds the possibility of expanding the development of hop aroma products.

F. Van Opstaele, G. De Rouck, P. Janssens and G. G. Montandon, An exploratory study on the impact of the yeast strain on hop flavour expressions in heavily hopped beers: New England IPA, Brewing Science March / April 2020 (Vol. 73) 26

PLANETARY ROTATING BED REACTOR – THE FUTURE OF DRY HOPPING?

If you ask a German engineer what dry hopping is, this would be the answer: Dry hopping can be described as a heterogeneous solid-liquid reaction, calling for high mass transfer rates, low resource consumption, and effective phase separation. And this is also the introduction of the article from German researchers looking into using a planetary rotating bed reactor for dry hopping on a model basis. For an easier understanding, I include the picture of the virtual 3D model of the planetary rotating bed reactor (PRBR) with a view into the reactor chamber and indicated flow pattern here. The PRBR consists of a rotating solid-liquid reactor kinematically enhanced by a planetary gear derivate, generating a push-back effect to prevent hop clogging of the peripheral filter mesh. This effect is based on the superposition of two rotary motions and thereby a directional change of the acting accelerations. The PRBR promises to be a fast, hop-saving and fully scalable technology for dry hopping and other heterogeneous reactions, since it combines efficient mass transfer and filtration in one device. This model sounds very promising and further research including utilisation and sensory aspects are planned for the near future.

Von Heynitz C., et al: A Novel Dry Hopping Technology: Kinematic Modelling of a Planetary Rotating Bed Reactor, Brewing Science, May/June 2020

THE PRESSURE IS ON – ALSO FOR HOPS!

Using supercritical CO_2 is a very efficient way to extract hops. Until now, hops have been extracted with supercritical CO_2 reaching a maximum pressure of 300 bar. This year, an extraction plant in the Hallertau will be commissioned that will operate at 500 bar. The primary motivation behind increasing the pressure to 500 bar are the energy savings gained due to the enhanced properties of CO_2 as a solvent at this pressure and hence a greater contribution to sustainability. These German researchers describe in their study the impact of these extraction differences on the final product. Both types of extract (extracted at 300 vs 500 bar) were compared and beers were brewed with these extracts. Besides containing more chlorophyll – the extract is "greener" – the 500 bar extract is slightly richer in xanthohumol and contains more auxiliary bitter substances. The extract yield based on the quantity of pellets is about 1 % higher at 500 bar than at 300 bar. All tasting results of the beers brewed with the different extract types indicate that no significant differences exist in the sensory profile of beers.

Forster, A., Schüll, F.: Advances in hop extraction with supercritical carbon dioxide, preprint of Brauwelt International, https://www.brauwelt.com/en/topics/raw-materials

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- Hop Flavor Impact Day
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Do you have any questions or would you like to book your course? Please send a mail to Susanne: susanne.hortolani@barthhaas.de